

INTESTINAL OBSTRUCTION

* Definition :-

- Arrest of downward propulsion of intestinal contents.

* Classifications :-

(A) According to Pathological nature :-

- ① Simple obstruction :- mechanical occlusion without interference with gut blood supply.
- ② Strangulation :- significant impaired blood supply.
 - Pure :- as mesenteric artery occlusion (patent lumen).
 - Mixed :- as strangulated hernia, volvulus and intussusception, (blocked lumen & vessel)
- ③ Neurogenic :- as paralytic ileus; loss of peristaltic activity of gut (patent lumen)

(B) According to Level of obstruction :-

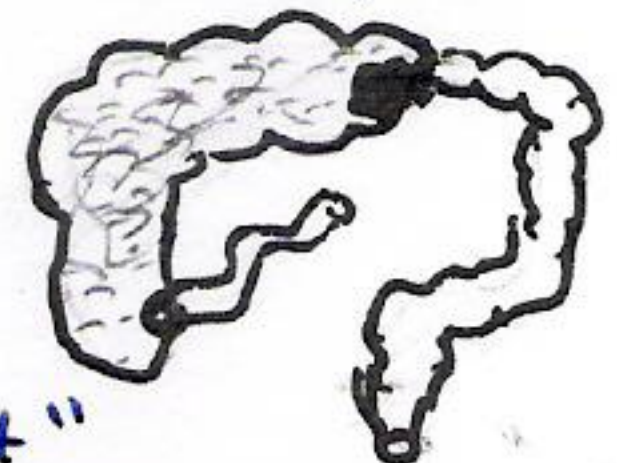
- ① (High) small bowel obstruction :- (early vomiting, late constipation) ^{bilious.}
- ② (Low) small bowel obstruction;
- ③ Large bowel obstruction → (early constipation, late vomiting) ^{faeculent}

(C) According to onset & course:

- ① Acute obstruction :- → rapid course (common in small intestine)
- ② Chronic obstruction :- → slow progressive course. (more in large)
- ③ Acute on top of chronic → as faecal impaction on ca colon.
- ④ Subacute → implies an incomplete obstruction → ^{Bailey & Love}

NB :- intestinal obstruction may also divided into :- (Bailey, current. churchill)

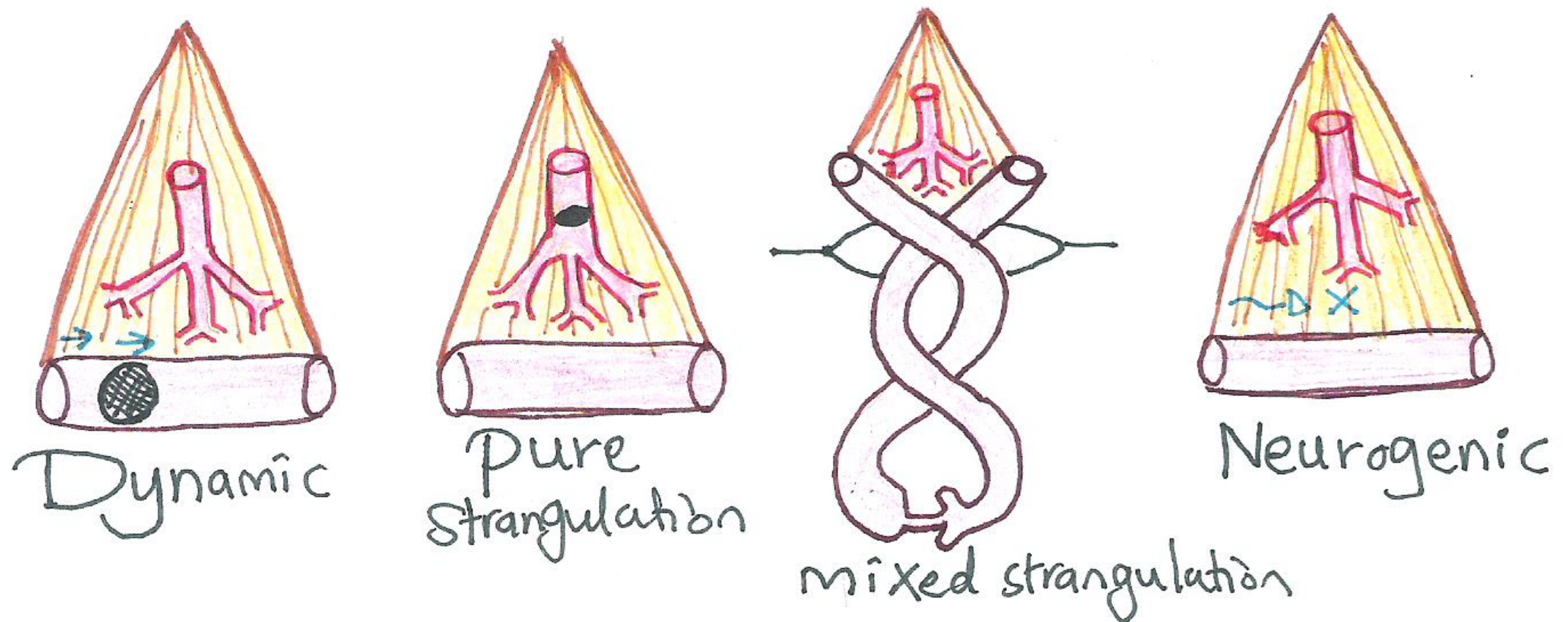
- ① Simple loop obstruction :- one point of obstruction.
- ② Closed loop obstruction :- two points of obstruction, enclosing a segment of bowel, classically seen if ca. colon (distally) with competent (working) ileocaecal valve (proximally) "competent valve present in 1/3 of pt"



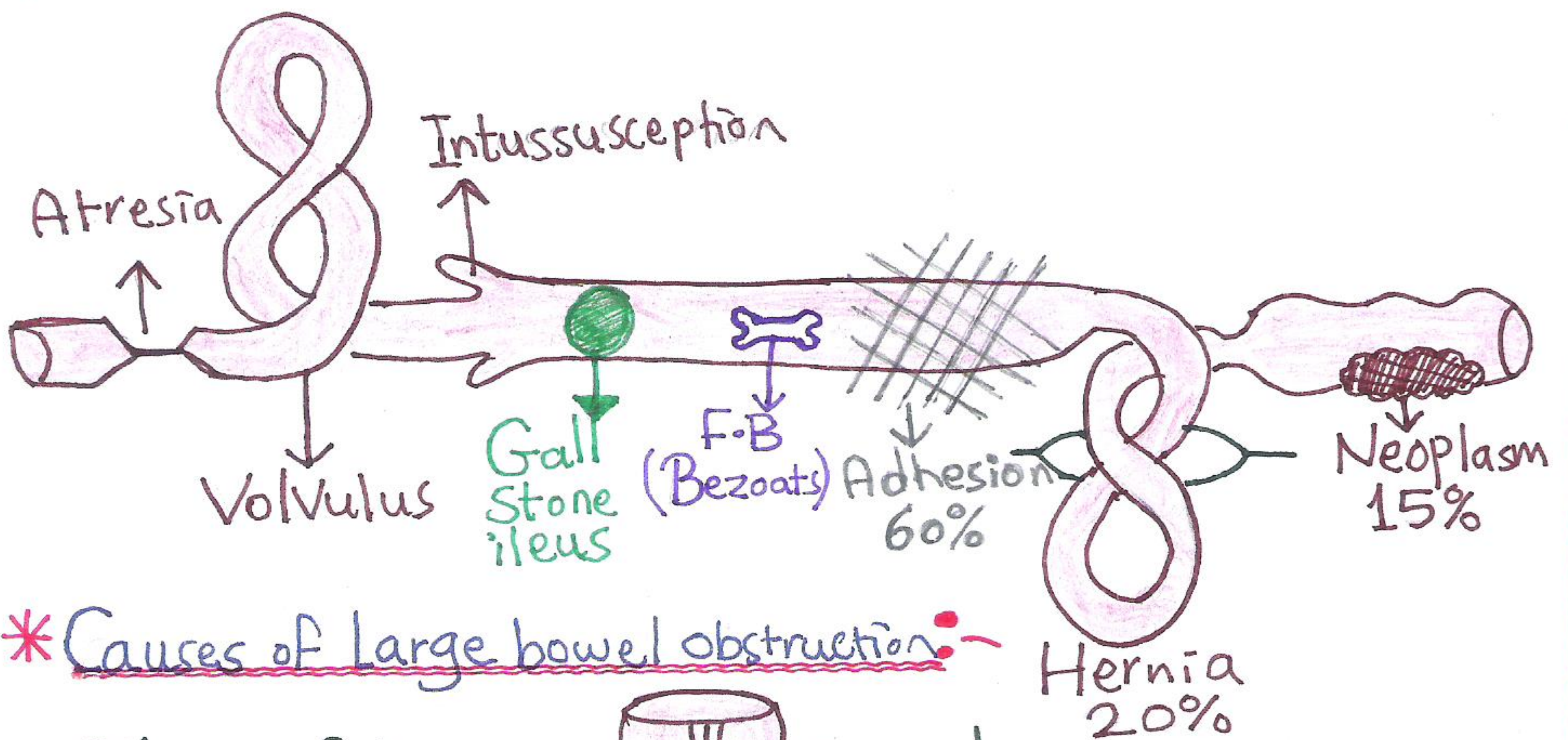
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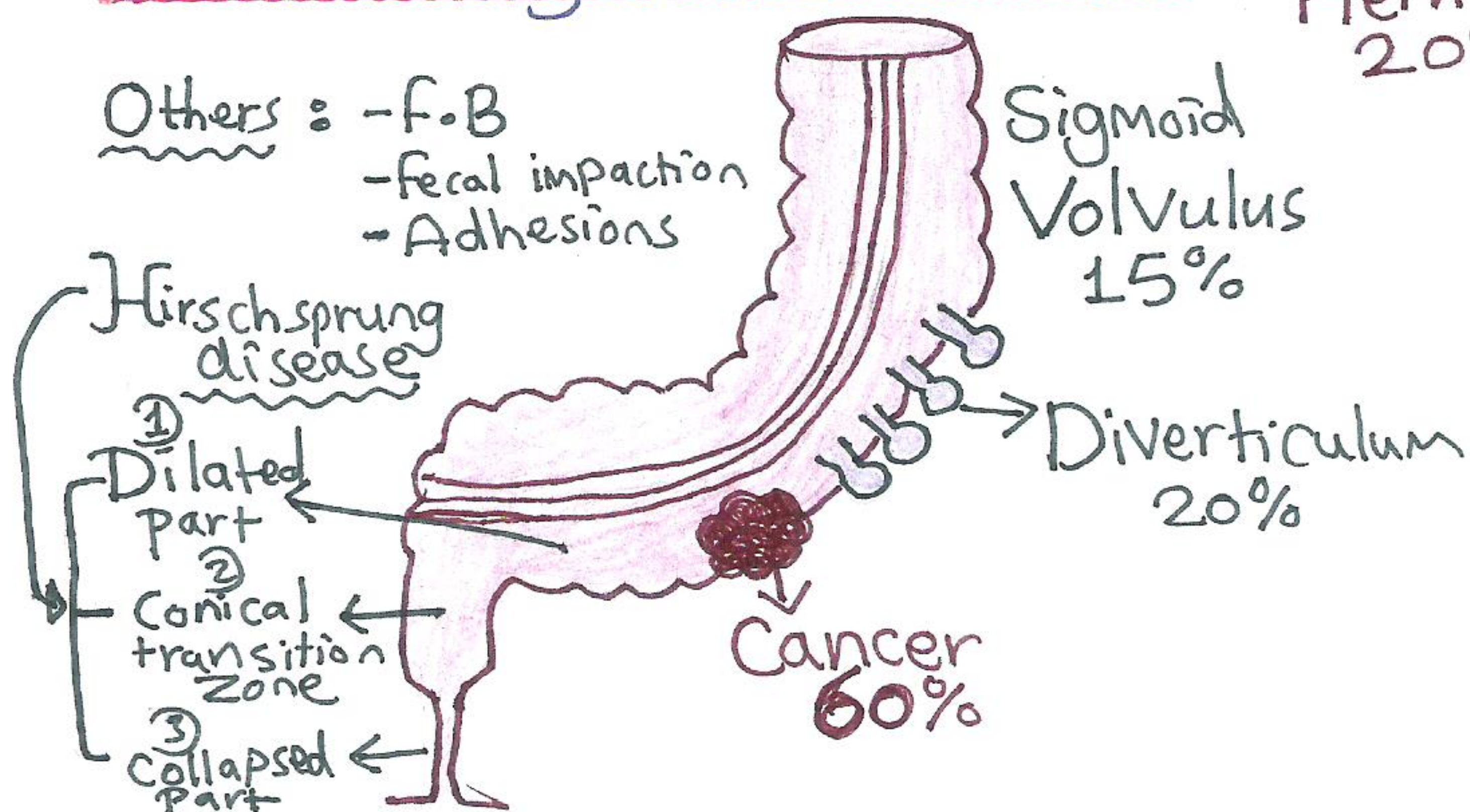
Intestinal obstruction



* Causes of small bowel obstruction :-



* Causes of Large bowel obstruction :-



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(I) - SIMPLE OBSTRUCTION

* Definition:

- Simple (Dynamic) obst. :- is mechanical occlusion of the gut lumen without interference of blood supply.

* Causes :- "Bailey & Love's"

- 1- Intraluminal :- as faecal impaction, FB, bezoar, gallstones.....etc
- 2- Intra-mural :- as stricture (trauma, cong.), Malignancy, Crohn's, ...etc
- 3- Extra-mural :- as adhesions, hernia, volvulus, ...etc.

* Causes according to age :-

- 1- Neonates :- cong. atresia, volvulus neonatorum, meconium ileus, Hirschsprung's disease, anorectal malformation, annular pancreas
- 2- Infants :- intussusception, Hirschsprung's dis. & strangulated hernia.
- 3- Children :- strangulated hernia, FB, intussusception
- 4- Adults :- Adhesions, strangulated hernia.
- 5- Elderly :- Colon carcinoma, strangulated hernia.

* Pathology:

(A) * Distal segment :- empties & becomes collapsed → Constipation

(B) * Proximal segment :-

- Hyperperistaltic wave : due to stretched smooth muscle by distended bowel → ↑ contraction power (to overcome obst.) which → Colicky abd. pain.
- Antiperistaltic wave : due to failure of dislodge contents of bowel → antiperistaltic wave → Vomiting.
- Distension : due to dilated bowel by gas & secretions which → stagnation → infection & fermentation. → Distension

Gas produced by :-

- ① swallowed air (68%)
- ② diffusion from blood vessel of bowel wall (22%)
- ③ bacterial fermentation (10%)

- Distension → vein occlusion → wall oedema → artery occlusion → ischaemia & gangrene → gut perforation → Peritonitis.

* Clinical Picture :-

● Symptoms :- the 4 cardinal symptoms of acute IO are:

- Colicky pain is usually 1st symptom, due to hyperperistalsis.
- Vomiting: occurs early in high obstruction (bilious ^{green} "bile") and late in low one (faeculent ^{brown}) or even absent. (may be whitish gastric juice at 1st)
- Distension: marked in low obstruction (colon), central in low small bowel obst. & even absent in high obst.
- Constipation: may named absolute constipation or "opstipation" i.e failure to pass stool & even flatus, late in high obst.

● Signs :- it depends on severity & duration :-

- signs of dehydration (dry tongue, oliguria, ↑HR, ↓BP. ... etc)
- Abdominal distension, visible peristalsis, ^{step ladder} tympanic abdomen (resonant ^{hyper}), exaggerated bowel sounds & may absent. ^{late}
- you have to examine hernial orifice, do P/R exam.

* Investigations :-

● Blood invest. :- u/e/c (Na⁺, K⁺), CBC, ... etc

→ ↓K⁺, ↑Na⁺, ↑amylase, ↑LDH may seen in strangulation
Bailey & Love

● Plain x-ray :- three different films may be done :-

1. Supine abd. x-ray → shows distended bowel :-
 - if Jejunum: regular ^{complete} mucosal folds (valvulae conniventes)
 - if ileum: featureless tubes (no mucosal folds).
 - if colon: irregular, incomplete folds (haustrations)
2. Erect abd. x-ray → shows multiple ^{air} fluid levels
if > 3 fluid level → ^{intest. diagnostic} obstruction (IO).
normal fluid levels are:
 - fundus of stomach
 - duodenal cap
 - terminal ileum
3. Erect chest x-ray → May shows air under diaphragm in case of perforated bowel.

● Ultrasound: can reveal distended bowel, mass of intussusception or ca colon, gallstone (G.S. ileus) ... etc.

● Others: CT scan (barium not used in contrast studies, as barium is dangerous & no need for contrast, but if needed contrast use gastrograffin) → current
(enema may indicated in intussusception) → Fleish & Michael

* Treatment :-

- ttt of acute I.O. (int. obst) is urgent relief of obstruction, usually by surgery, after adequate preop. preparation.
- Some cases respond to conservative ttt e.g :-

- Subacute I.O. in case of adhesion
- intussusception :- reduced by hydrostatic effect of barium ^{enema}
- Faecal impaction :- enema dissolve the mass.
- Sigmoid volvulus :- untwisting by rectal tube.

* Conservative ttt :- (Drip & suck regimen) :-

- NPO (Nil orally), I.V fluid (correct electrolyte & shock).
- NGT (Ryle's tube) to decompress stomach & intestine from secretion, swallowed gas, ↓ aspiration, ↓ nausea. ^{pneumonia}
- Foley's catheter for urine output
- two hourly temp. & pulse check & 8 hourly abdominal examination (exclude strangulation...etc)

* Surgery :-

- If failed conservative.
- Strangulation (urgent, better within 1 hr).
- tumour :- in Lt sided colon may need Hartmann's ^{procedure.}
- Large-bowel obst. ^{caecum ≥ 10 cm + tender → strong indication.} more likely to need surgery than small-bowel. ^{→ (fresh surgery - Michael).}

- Pre-operative preparation to correct fluid & electrolyte (Drip & suck regimen).
- Exploratory Laparotomy (usually by Rt Paramedian incision, but in strangulation operate over it)
- First look for caecum (if dilated → colon obst. & vice versa) relief obstruction e.g division of adhesive bands, reduction of hernia ^{& repair}, untwisting of volvulus
- assess bowel viability if non-viable resection and anastomoses (in small bowel). if doubtful ^{wait after relief obst} ^{hot Packs} ^{O₂, correct anemia}

- Signs of non-viability are
 - peristalsis loss
 - no lustre
 - colour change: green - black
 - no pulsation in mesentery

- If inoperable do bypass surgery or ileostomy, colostomy

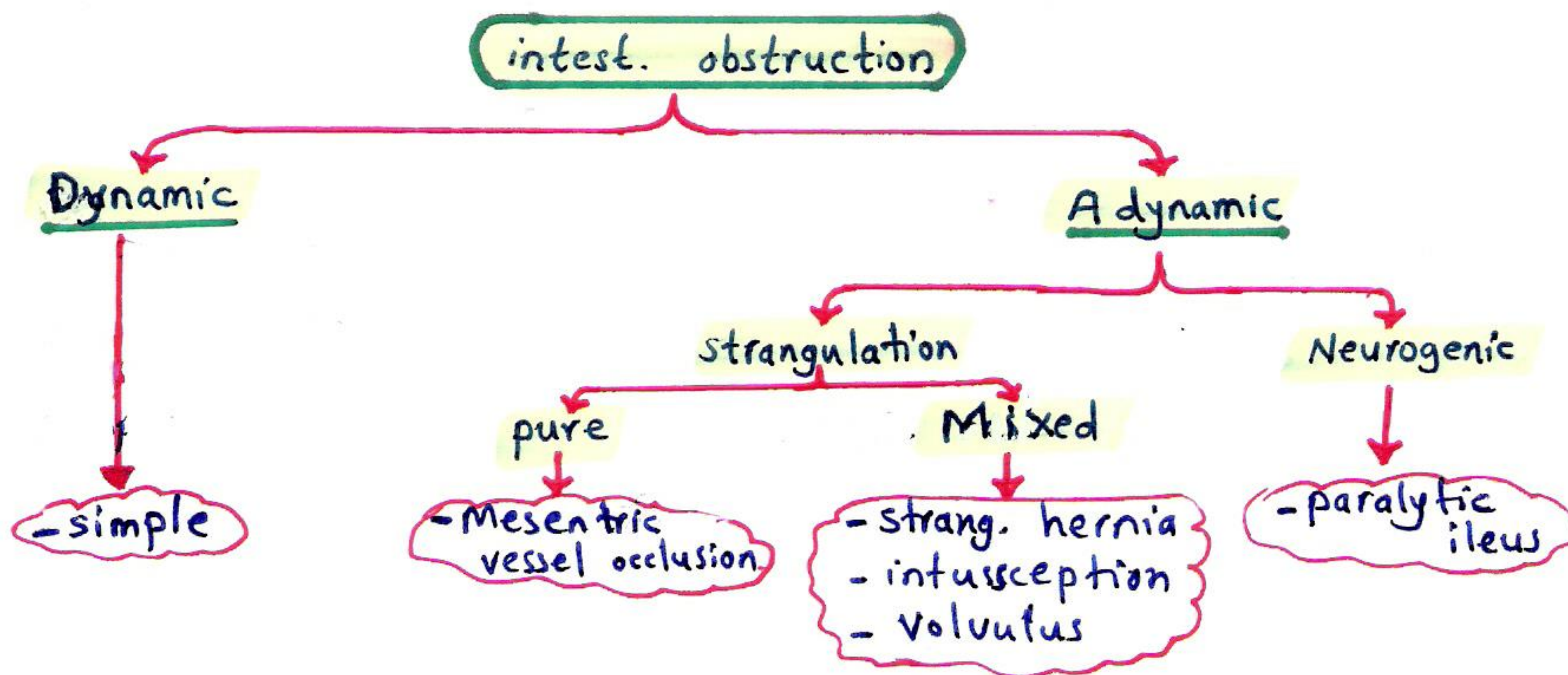
* Complications of I.O. :-

1. Electrolyte imbalance & dehydration.
2. Inhalation pneumonia.
3. Peritonitis.
4. septic shock & death.

* Prognosis :-

→ churchill's -

- small bowel obstruction has a very low mortality rate if simple, mortality ↑ if strangulation & elderly.
- in large bowel obst. overall mortality $\approx 15\%$.
- Mortality rate may reach up to 25% with elderly.

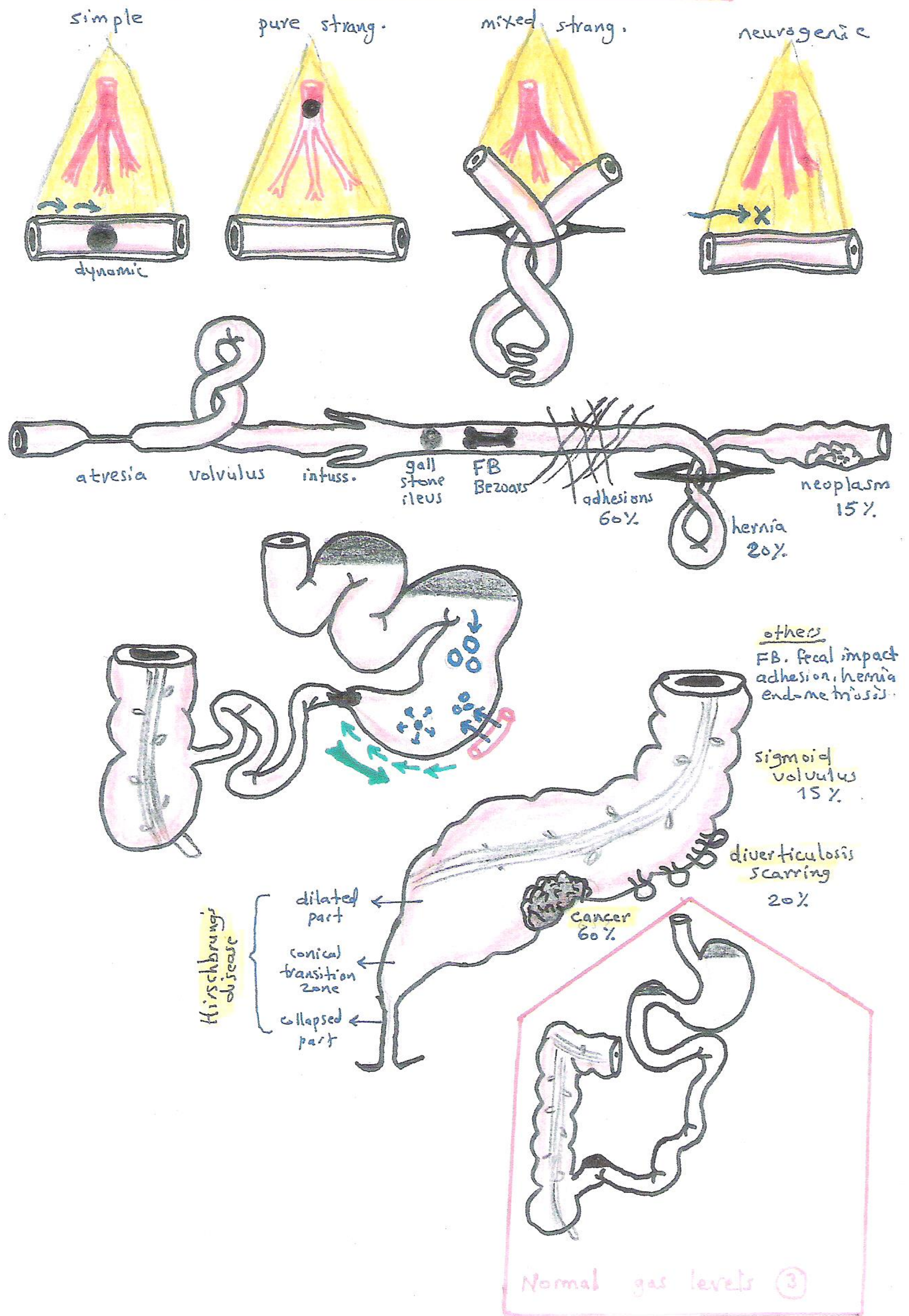


* duodenal atresia & stenosis have equal incidence.

* Bolus obstruction $\begin{cases} \rightarrow \text{can be caused by eating unripe apples} \\ \rightarrow \text{may be complication of postgastrectomy (partial)} \\ \rightarrow \text{can be caused by gall-stone, bezoars, worms (ascaris)} \end{cases}$

* Faecal impaction $\begin{cases} \rightarrow \text{common in elderly} \\ \rightarrow \text{may be palpable through abd. wall} \\ \rightarrow \text{can be relieved by aid of fingers as under GA} \end{cases}$

« **INTESTINAL OBSTRUCTION** »



(II) PARALYTIC ILEUS

(6)

* Definition :-

- failure of peristaltic waves of intestine due to failure of the neuromuscular mechanism. (or cessation of GIT motility).

* Aetiology :-

- ① Reflex inhibition of motility → following operation, spine fracture, retroperitoneal Hge, (unknown but may symp. overaction)
 - Post op. is commonest cause, for 24-48 hr, if prolonged search for ($\downarrow K^+$, leaking aneurysm, ... etc), it depends on bowel manipulation & irritation by blood, bile, urine, pus.
- ② Toxic inhibition → Peritonitis, pus, ... etc.
- ③ Metabolic abnormalities → $\downarrow K^+$, $\downarrow Na^+$, uraemia, DKA, ... etc
- ④ Drugs → anticholinergics (eg Probanthine), antidepressants, ganglion blockers

* C/P :-

- Distension, vomiting, constipation, but NO colicky pain.
- Silent abdomen (no bowel sounds) $\pm$ s/s of peritonitis

* Management :-

- History, exam., invest. → as simple obst.
- Prevention :- by
 - Preop. preparation (correct U/E/C)
 - operative :- gentle handling of intestine
 - postop. :- NGT in major surgery.
- Treatment :- by
 - Drip & suck regimen (NPO, IV fluid, NGT suction...)
 - correct fluid & electrolyte
 - the above measures usually succeed but if failed look for cause as anastomotic leak & peritonitis which might need surgery
 - Drugs (parasympathomimetic as prostigmine) may be helpful in resistant cases.

Paralytic ileus	usually settle in 3-4 days	absent bowel sounds	painless	x-ray → generalized dilatation
Simple obst.	may persist	high pitched	colicky pain	AXR → localized.

(III)- MESENTRIC VASCULAR OCCLUSION

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* Aetiology & Pathology :-

- Mesenteric artery embolism (or thrombosis) or mesenteric venous thrombosis $\rightarrow$ ischaemia $\rightarrow$ mucosal death within 3 hrs $\rightarrow$ shedding & bleeding $\rightarrow$ followed by damage of whole intestinal thickness within 6 hrs $\rightarrow$ gangrene with sero-sanguinous fluid in peritoneum $\rightarrow$ perforation of intestine $\rightarrow$ peritonitis
- Reperfusion damage by oxygen free radicals from ischaemic bowel may occur after return of blood flow (either spontaneous or surgical).

* Clinical Picture :-

- General = S/S of hypovolaemic shock (tachycardia, tachypnoea, hypotension, hypothermia)
- Local = Severe acute abdominal pain + repeated vomiting + Bleeding Per rectum
- abdomen is tender, rigid + absence bowel sounds.

* Treatment :-

- Preop. resuscitation (treat shock, IV antibiotic, NGT, etc)
- Urgent laparotomy $\rightarrow$ if gangrenous bowel do resection
- $\rightarrow$ if viable restore blood flow by embolectomy (or endarterectomy or by pass surgery) $\rightarrow$ thrombus
- Post op. heparin ^{anti-co} & folic acid

NB :- If $>70\%$ of small intestine is resected $\rightarrow$ Short bowel syndrome which causes malabsorption, corrected 1st by TPN (Total Parenteral Nutrition) then gradual oral feeding until patient can depend totally on oral feeding (take few months for intestine to adapt)

NB :- Ischaemic colitis :- (Baily & Love's)

- common in old (50-70 yr) with chronic vascular disease or heart problem (AF) as it caused by sudden $\downarrow$ BP $\rightarrow$ S/S of shock + bleeding P/R
- Splenic flexure is the commonest site
- Surgery seldom needed for gangrene if occurs of stricture after healing and conservative management usually successful.

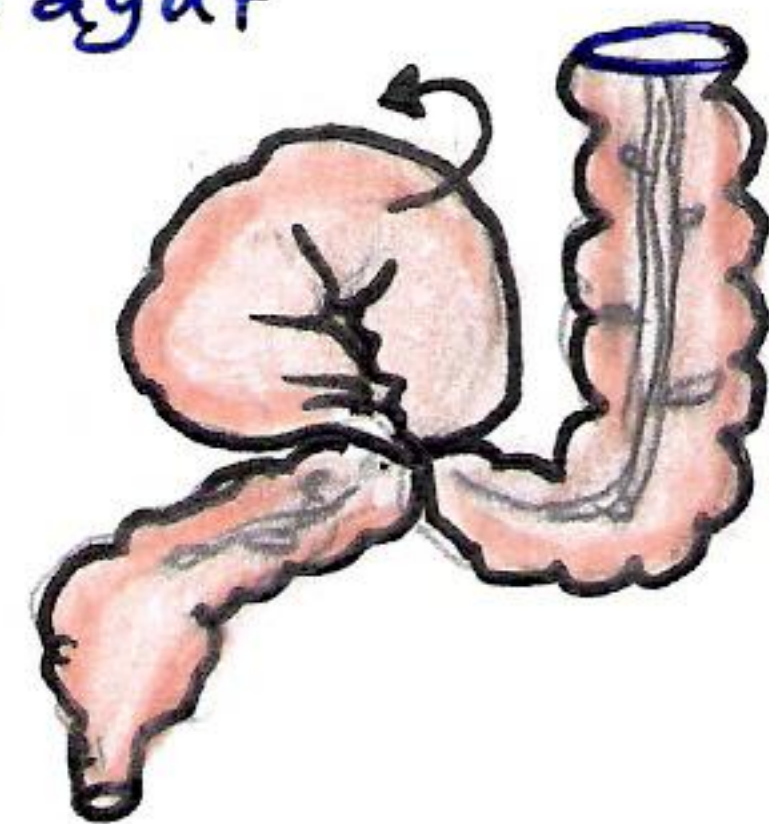
(IV) - VOLVULUS

* Definition :-

- Twisting of a bowel loop around its mesenteric axis.

* Pathology :-

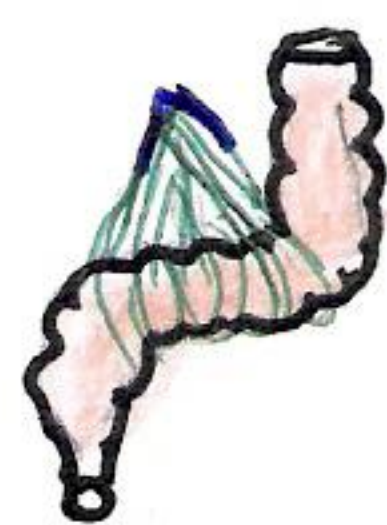
- Volvulus considered as strangulation where it produces obstruction (closed loop type) and vessel occlusion in mesentery
- Ischaemia, gangrene & ↑ pressure inside closed loop favours perforation & peritonitis.
- Sigmoid is the commonest involved, but also affect caecum, stomach or small intestine also midgut volvulus (Volvulus neonatorum)
- Twisted loop of gut called "Omega loop"
↳ usually anticlockwise.



SIGMOID VOLVULUS

* Predisposing factors :- (Bailey & Love's)

- 1- Long sigmoid colon & narrow base sigmoid mesocolon.
- 2- Loaded sigmoid as in chronic constipation (↑ pressure)
- 3- adhesions at sigmoid facilitate twisting.



* Clinical Picture:

most common cause of large bowel obst. in indigenous black Africans. ^{Bailey & Love's}

- Middle-aged & elderly males more affected
- Sudden lower abd. colicky pain + distension ± effortless vomiting ^{constipation early}
- o/e: distended abdomen, silent abdomen ± s/s peritonitis ^{late}

* Investigations:

- Plain AXR (abd. x-ray) ^{distended loop in LIF shape of "Coffee bean"}
- Blood u/e/c, CBC.
- Barium enema in doubtful cases :- shows 'bird's beak' as lumen tapers toward volvulus. or called 'Ace of spade sign' ^{churchill}



* Treatment :-

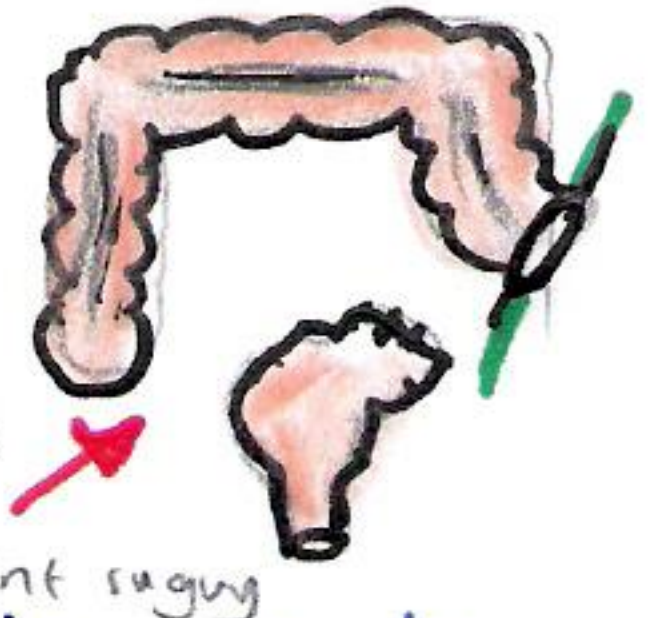
● Conservative ttt :-

- indicated in early cases with no evidence of gangrene.
- Done by "Rectal tube" passed through sigmoidoscope to untwist sigmoid loop, if success → gush of gas & fluid stools.
- the tube left in place ^{for 48 hr.} & prepare for elective resection of the long sigmoid to prevent recurrence.

● Surgery :-

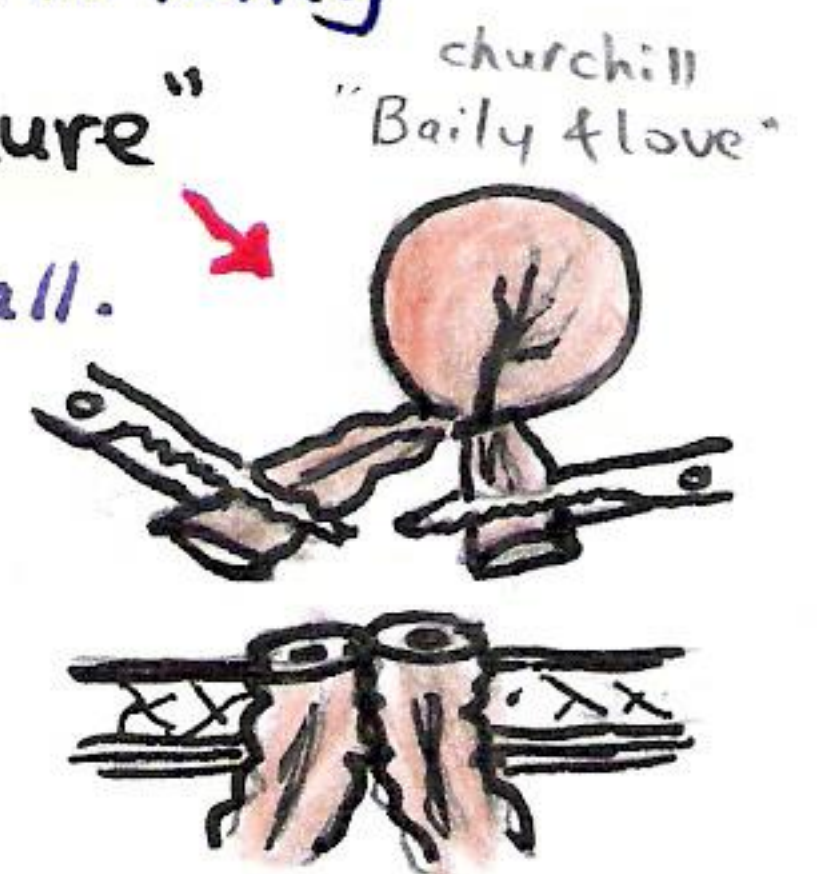
- Emergency surgery (laparotomy) done if unsuccessful conservative or suspected perforation & peritonitis.

- Bring the proximal colon (after resecting gangrenous part) into skin (colostomy) and suture the distal end left in pelvis → "Hartmann's procedure"



- other method is to resect gangrenous part & two ends of colon brought out as double-barrelled colostomy which later closed → "Paul-Mickulicz procedure"

NB: if colon viable, fix it to post. abdominal wall.

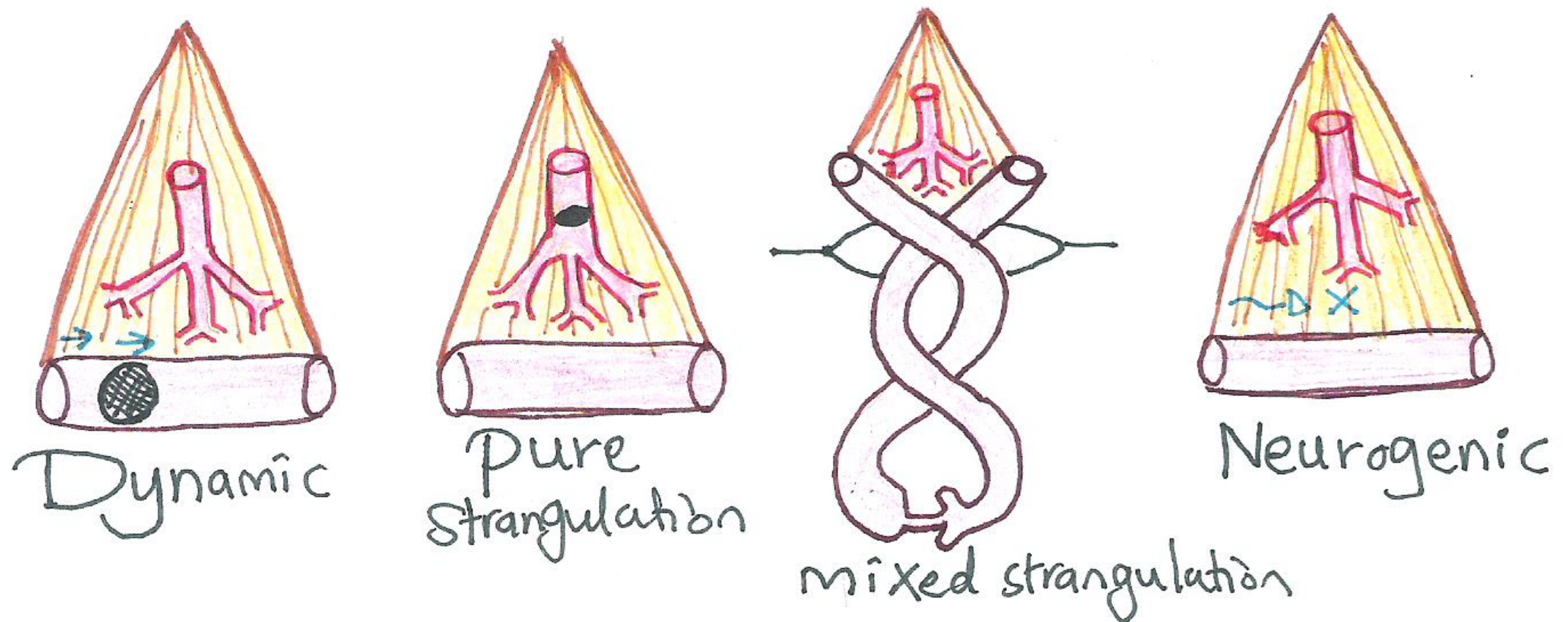


(V) OTHER FORMS OF IO.

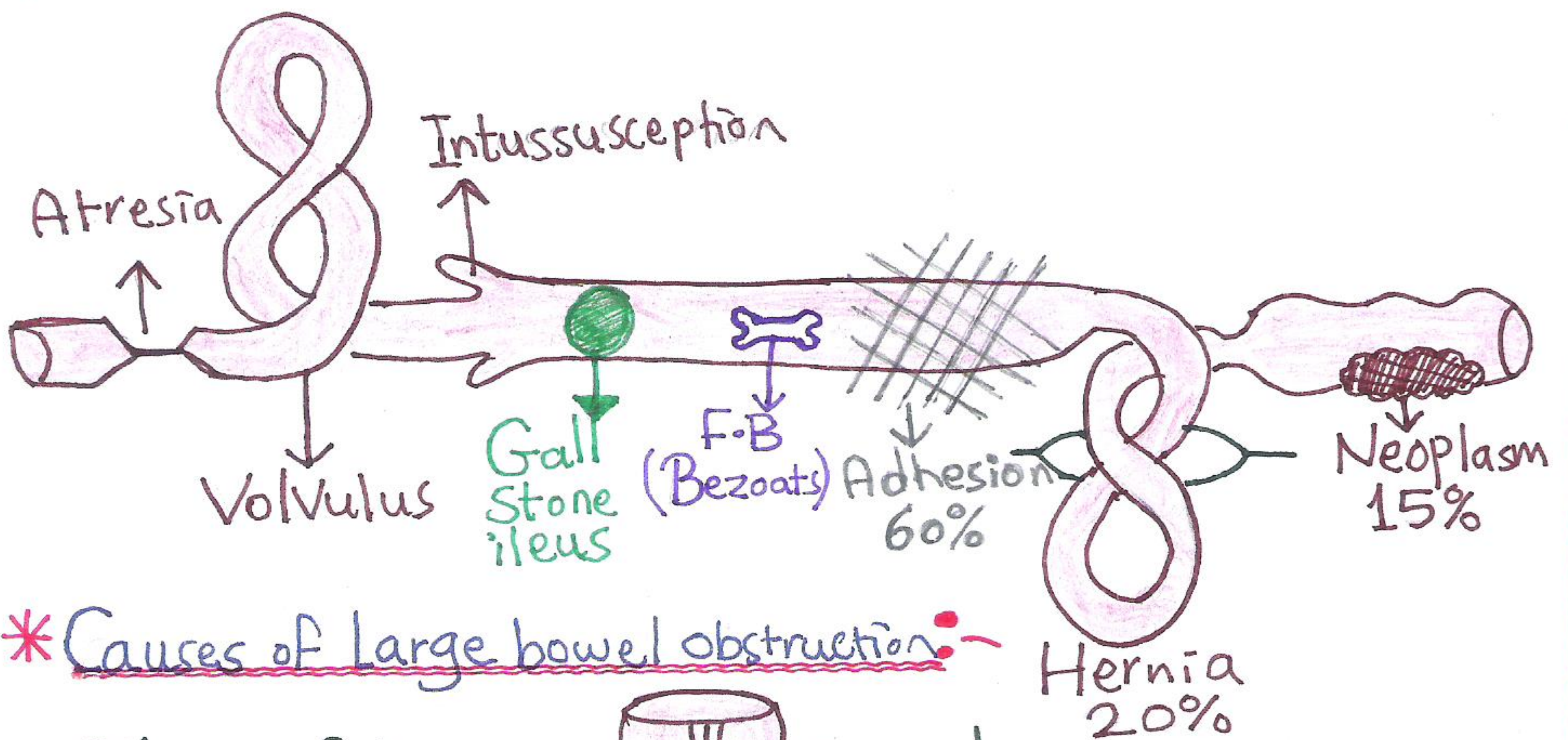
- VOLVULUS NEONATORUM.
- INTUSSUSCEPTION.
- MECONIUM ILEUS.
- MECONIUM PLUG SYNDROME.
- DUODENAL ATRESIA.
- HIRSCHPRUNG'S DISEASE.

See paediatric surgery.

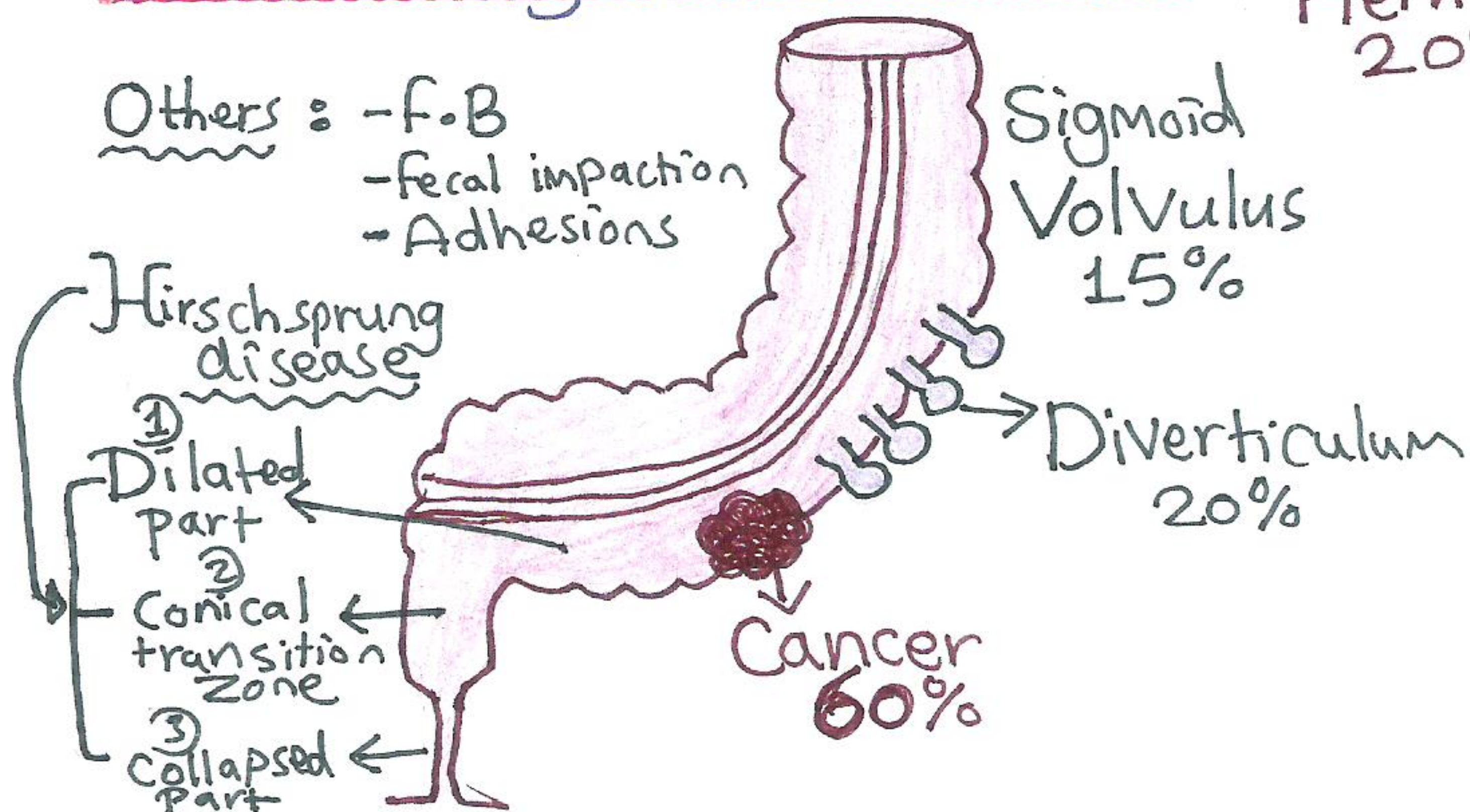
Intestinal obstruction



* Causes of small bowel obstruction :-

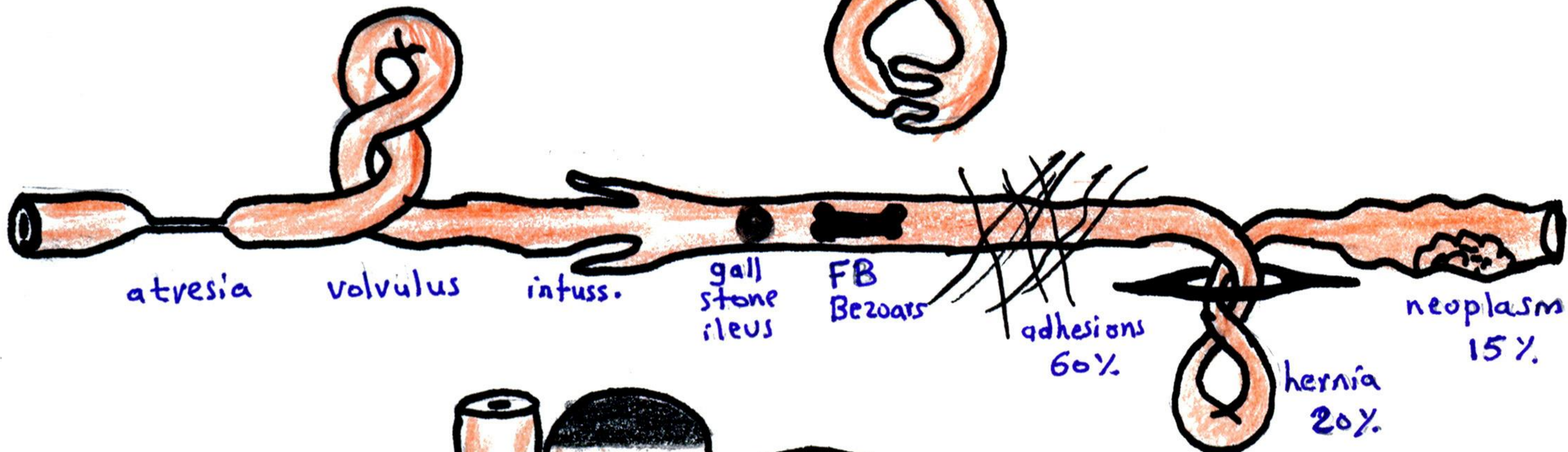
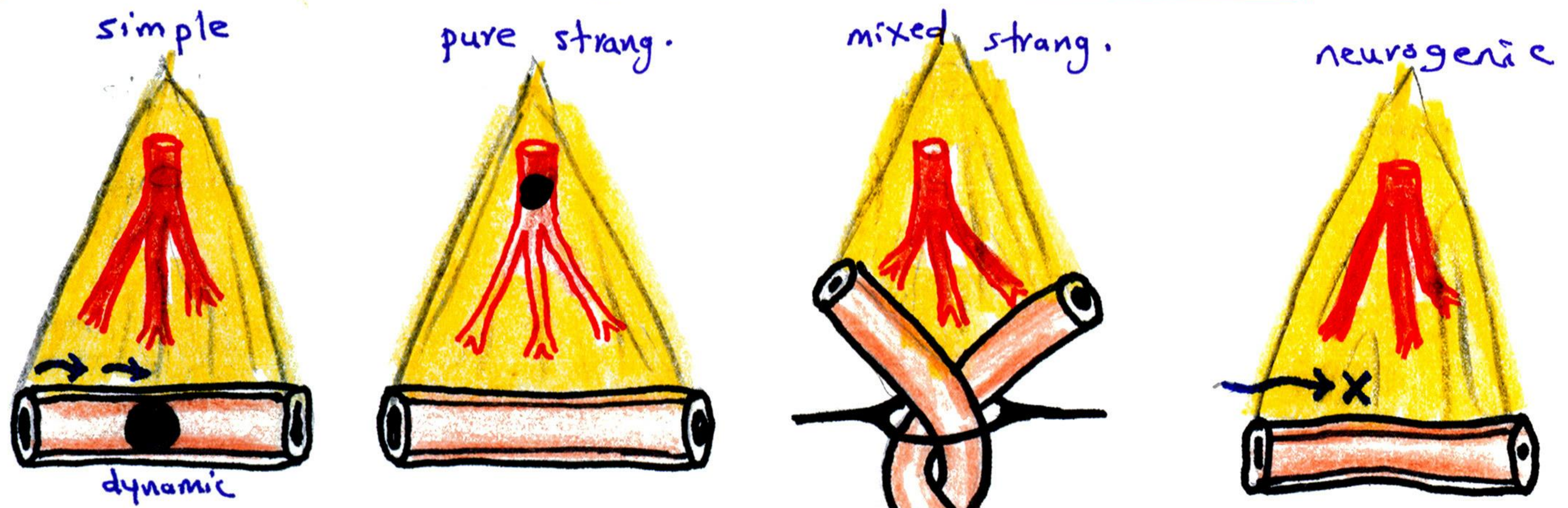


* Causes of Large bowel obstruction :-



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« **INTESTINAL OBSTRUCTION** »



others

FB, fecal impact
adhesion, hernia
endometriosis

sigmoid
volvulus
15%

diverticulosis
scarring
20%

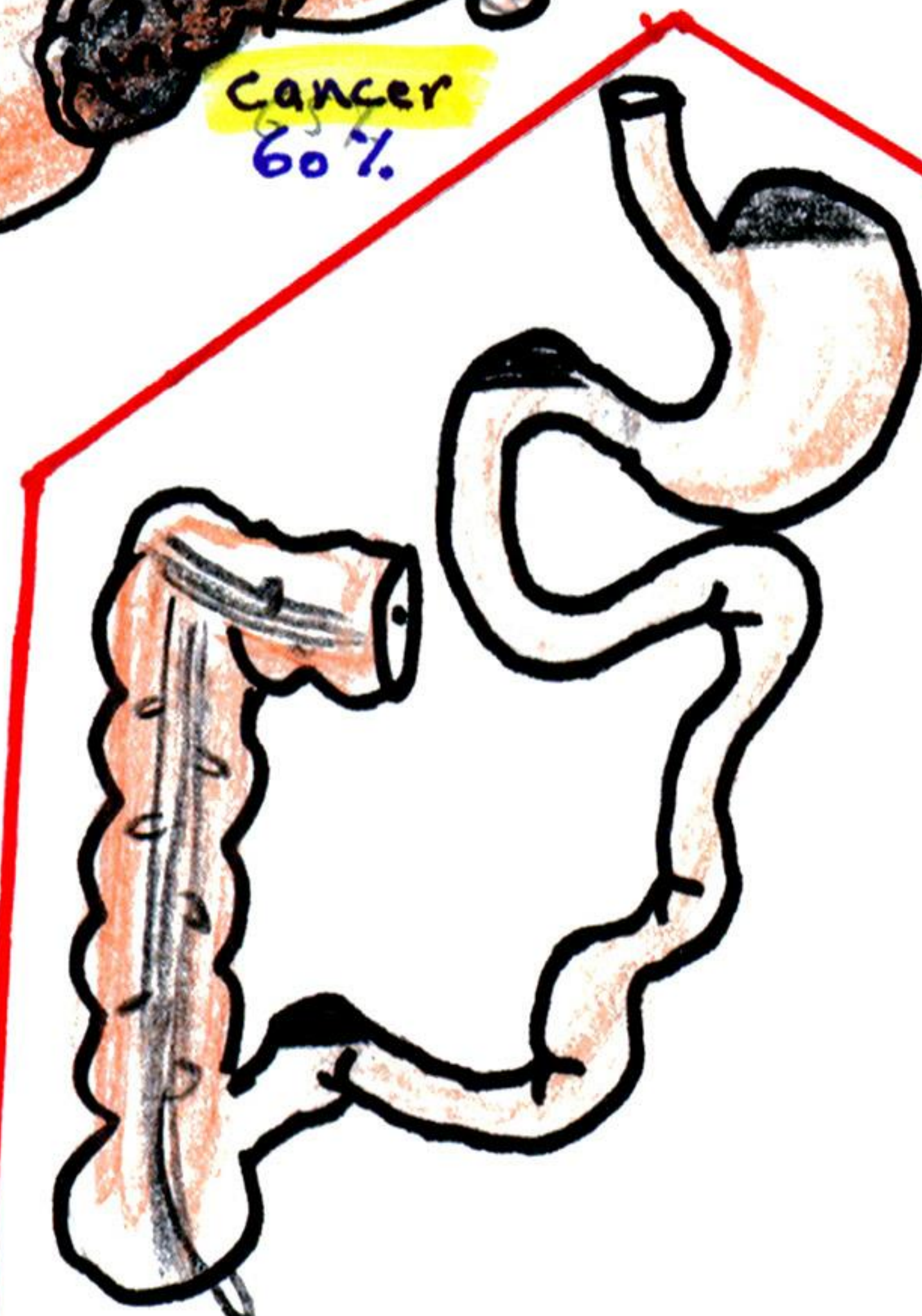
Hirschprung's disease

dilated part

conical transition zone

collapsed part

Cancer
60%



Normal gas levels (3)